

Appendix A

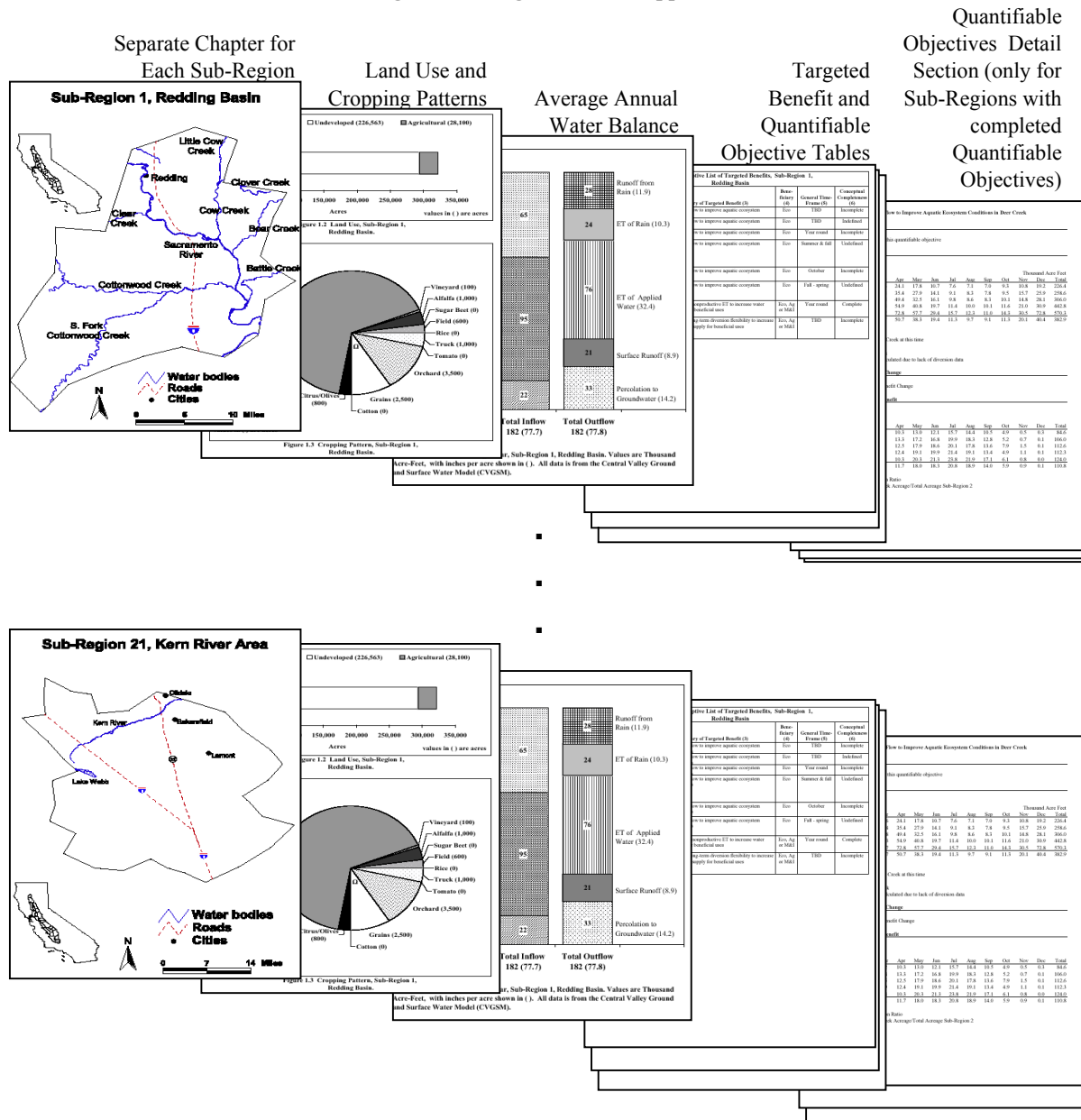
Complete List of Quantifiable Objectives by Sub-Region

Appendix A contains a list of the completed and potential Quantifiable Objectives (QOs). To-date, 196 potential QOs have been identified. Of these, approximately 50 have been completed. WUE proposals that incorporate completed QOs will be given extra weight in the selection process.

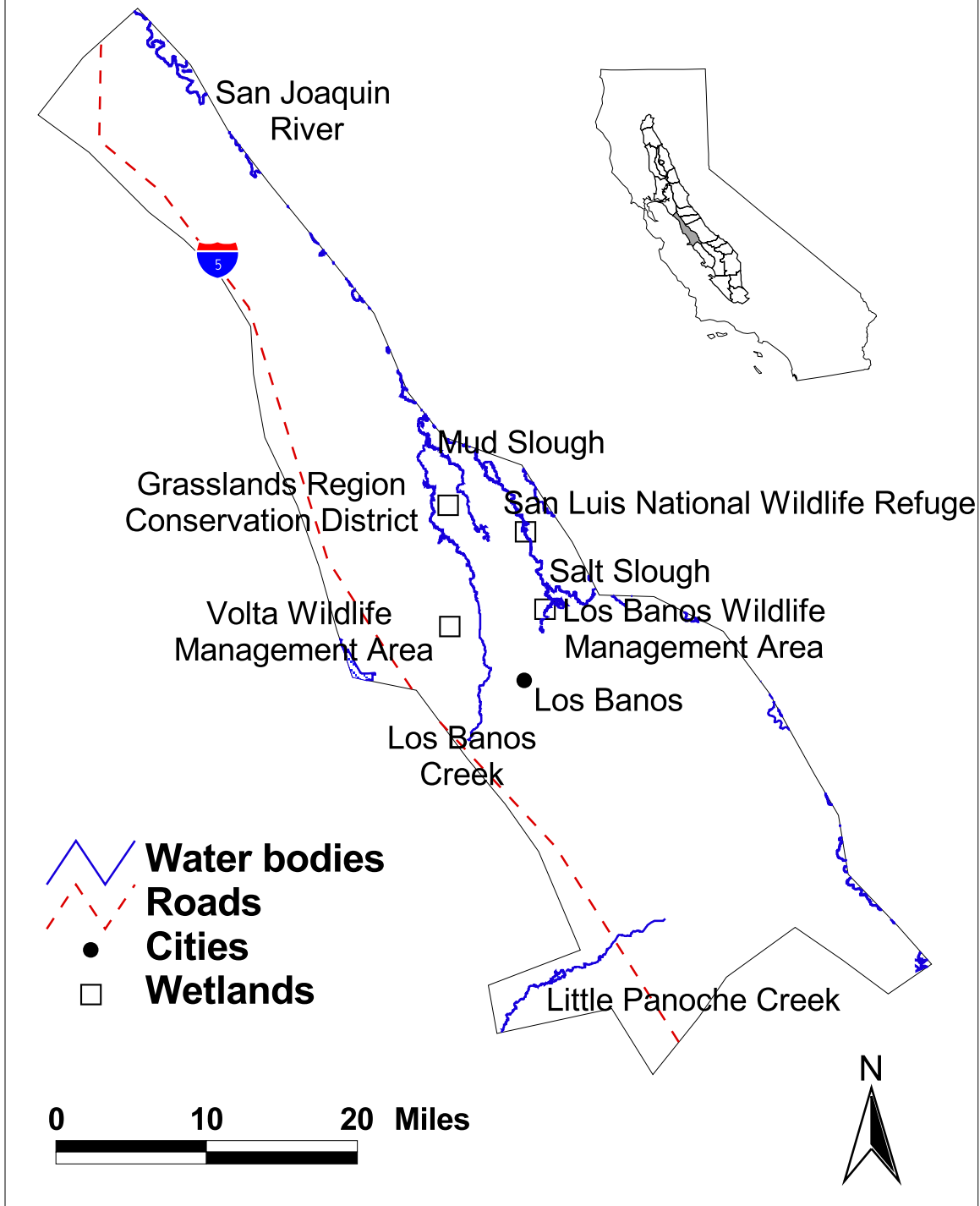
Readily available data does not exist to allow completion of the remaining QOs. However, approximately 45 of the uncompleted QOs have been identified as high priority, and proposals that are linked to these priority outcomes (or Targeted Benefits) will also receive extra weight in the selections (although not as much weight as those that incorporate completed QOs).

Appendix A is organized into 21 chapters that correspond to the 21 Sub-Regions defined in the QO analysis. Each chapter contains background information and details as illustrated in Figure A.I.

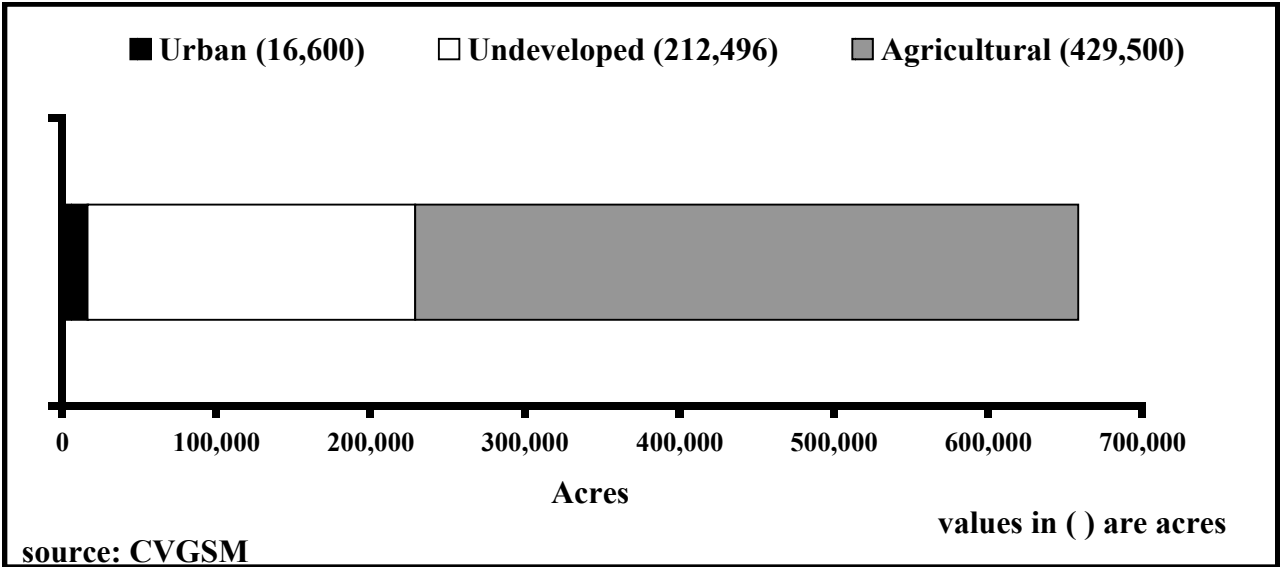
Figure A.I. Organization of Appendix A



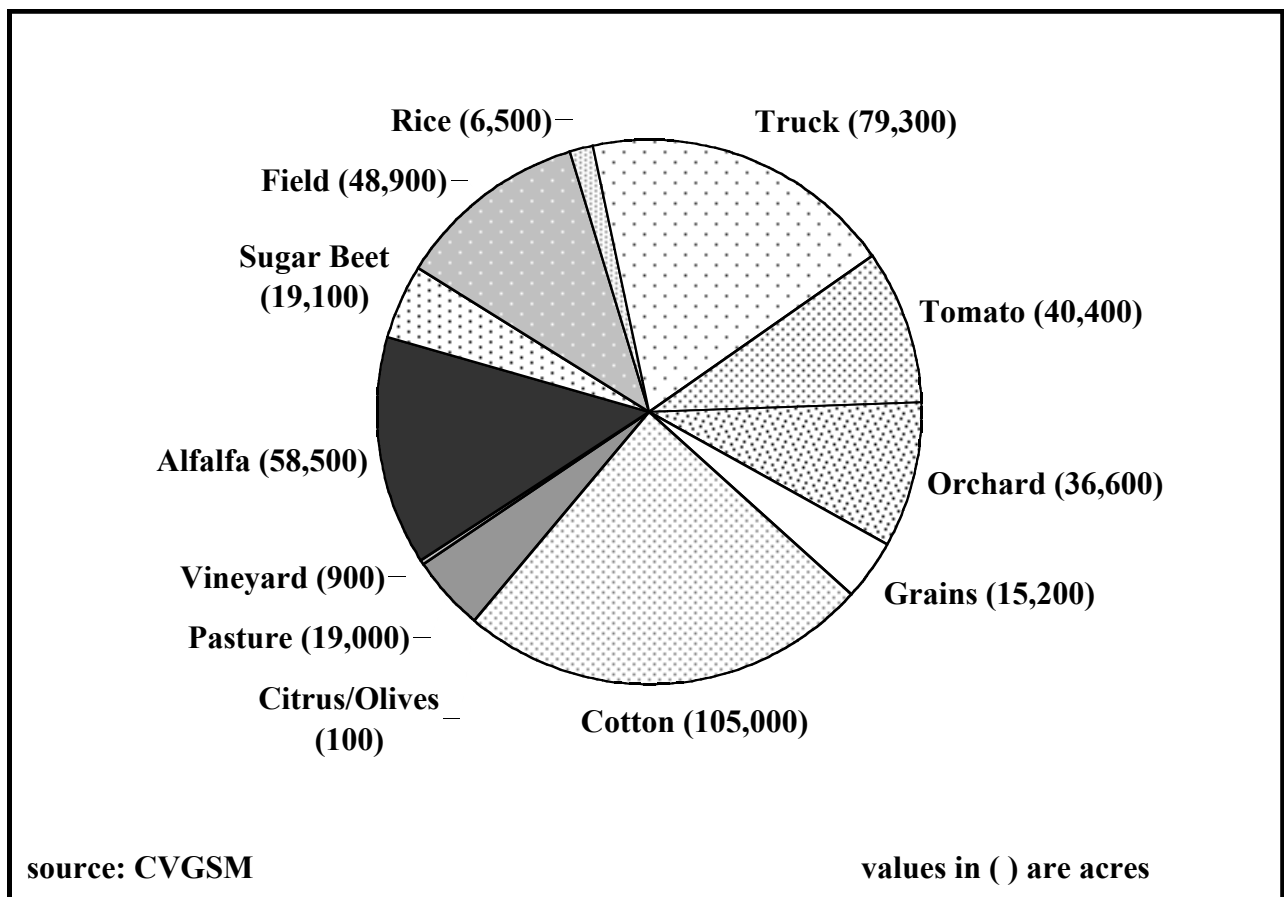
Sub-Region 10, Valley Floor west of San Joaquin River



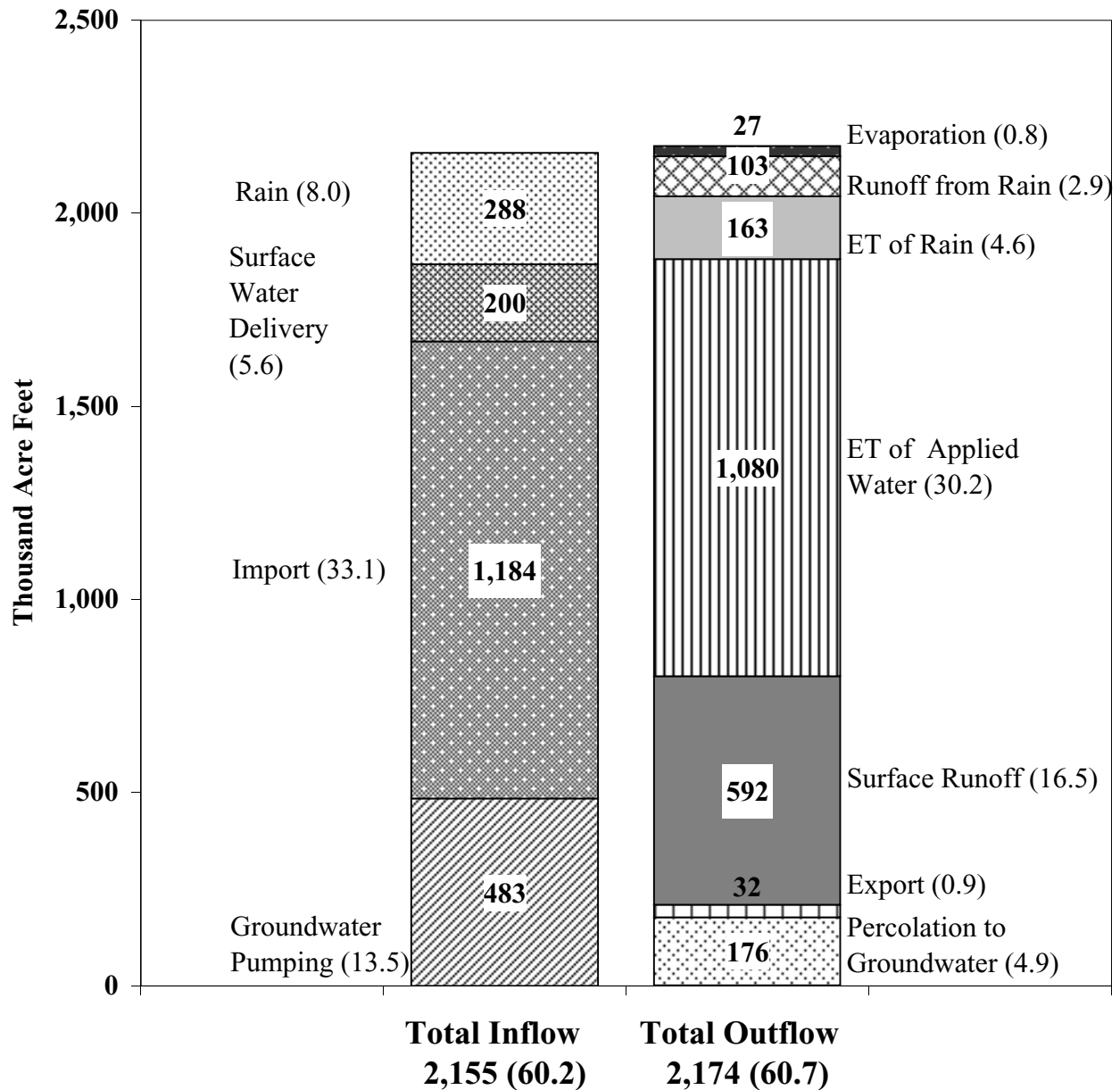
**Figure A.10.2 Land Use, Sub-Region 10,
Valley Floor west of San Joaquin River.**



**Figure A.10.3 Cropping Pattern, Sub-Region 10,
Valley Floor west of San Joaquin River.**



Sub-Region 10 Water Balance



Farm Water Balance, Average Year, Sub-Region 10, Valley Floor west of San Joaquin River. Values are Thousand Acre-Feet, with inches per acre shown in (). All data is from the Central Valley Ground and Surface Water Model (CVGSM).

**Table A.10.1. Descriptive List of Targeted Benefits, Sub-Region 10,
Valley Floor west of San Joaquin River**

TB # (1) [duplicate]	Location (2)	Category of Targeted Benefit (3)	Bene- ficiary (4)	General Time- Frame (5)	Conceptual Completeness (6)
92	West San Joaquin Tributaries	Flow: Provide flow to improve aquatic ecosystem conditions	Eco	Spring	Undefined
93 [115, 134, 150]	San Joaquin River	Quality: Reduce group A pesticides to enhance and maintain beneficial uses of water	Eco or M&I	TBD	Complete
95	Grassland Marshes	Quality: Reduce native constituents to enhance and maintain beneficial uses of water	Eco or M&I	TBD	Complete
96	Mud and Salt Slough	Quality: Reduce native constituents to enhance and maintain beneficial uses of water	Eco or M&I	TBD	Complete
97	Mud Slough	Quality: Reduce pesticides to enhance and maintain beneficial uses of water	Eco or M&I	TBD	Complete
98 [79]	San Joaquin River	Quality: Reduce native constituents to enhance and maintain beneficial uses of water	Eco or M&I	TBD	Complete
99	Salt Slough	Quality: Reduce pesticides to enhance and maintain beneficial uses of water	Eco or M&I	TBD	Complete
100	Orestimba Creek	Quality: Reduce pesticides to enhance and maintain beneficial uses of water	Eco or M&I	TBD	Complete
101 [82, 120, 137, 152]	San Joaquin River	Quality: Reduce pesticides to enhance and maintain beneficial uses of water	Eco or M&I	TBD	Complete
102	Grassland Marshes	Quality: Reduce salinity to enhance and maintain beneficial uses of water	Eco	TBD	Complete
103	Mud and Salt Slough	Quality: Reduce salinity to enhance and maintain beneficial uses of water	Eco, Ag or M&I	TBD	Complete
104 [123, 140, 154]	San Joaquin River at Vernalis	Quality: Reduce salinity to enhance and maintain beneficial uses of water	Eco, Ag or M&I	TBD	Complete
106	All affected lands	Quantity: Decrease flows to salt sinks to increase the water supply for beneficial uses	Eco, Ag or M&I	Irrigation season	Complete
107	All affected lands	Quantity: Decrease nonproductive ET to increase water supply for beneficial uses	Eco, Ag or M&I	Year round	Complete
108	All suitable lands	Quantity: Provide long-term diversion flexibility to increase the water supply for beneficial uses	Eco, Ag or M&I	TBD	Incomplete
109	Salt affected soils	Quantity: Provide long-term diversion flexibility to increase the water supply for beneficial uses	Ag	Irrigation season	Complete
110 [129, 146, 160]	Wetlands	Quantity: Provide long-term diversion flexibility to increase the water supply for beneficial uses	Eco	Variable	Incomplete
111	Specific managed wetlands	Quantity: Provide long-term diversion flexibility to increase the water supply for beneficial uses	Eco	Variable	Incomplete

**Table A.10.2. Quantified Targeted Benefits, Sub-Region 10,
Valley Floor west of San Joaquin River**

TB # (1) [duplicate]	Source and Description of Quantified Targeted Benefit (7)
92	ERPP: Provide flows of suitable quality water that more closely emulate natural annual and seasonal flow patterns in West SJ tributary watersheds. Provide a total watershed flow of 250 to 500 cfs to the San Joaquin River in dry and normal years for a 10-day period in late April to early May (appx. 5000-10,000 af)
93 [115, 134, 150]	303(d): Reduce [Group A pesticide] and DDT to ____.
95	303(d): Reduce selenium concentration to 5 ug/L.
96	303(d): Reduce selenium concentration to 5 ug/L and boron concentration to 2 mg/L from March 15 to September 15 and to 2.6 mg/L September 16 to March 14.
97	303(d): Reduce pesticides to ____.
98 [79]	303(d): Reduce selenium concentration to 5 ug/L and boron concentration to 2 mg/L from March 15 to September 15 and to 2.6 mg/L September 16 to March 14.
99	303(d): Reduce chlorpyrifos and diazinon to ____.
100	303(d): Reduce chlorpyrifos and diazinon to ____.
101 [82, 120, 137, 152]	303(d): Reduce chlorpyrifos and diazinon to ____.
102	303(d): Reduce salinity to ____.
103	303(d): Reduce salinity to ____.
104 [123, 140, 154]	Core: Reduce salinity levels at 0.7 dS/m April 1 - August 1, 1.0 dS/m September 1 - March 31 at Vernalis. 303d: Reduce salinity to ____.
106	Core: Reduce existing flows to salt sinks by ____ acre-feet per year.
107	Core: Reduce unwanted ET by ____ acre-feet per year.
108	Core: Enhance the effectiveness of potential conjunctive use programs by reducing flows to groundwater to ____ acre feet per year during periods of shortage; and increasing flows to groundwater to ____ acre feet per year during periods of excess.
109	Core: While remaining within the salinity threshold for a given crop, take advantage of periodic opportunities to reduce salinity impacts by increasing leaching by ____ during periods of excess supply and by reducing by ____ leaching during water short periods.
110 [129, 146, 160]	ERPP/ Cooperatively manage ____ acres of ag lands and restore ____ acres of seasonal, semipermanent, and Core: permanent wetlands consistent with the CV Habitat Jt Venture and N. Am. Waterfowl Mgmt. Plan.
111	Core: Provide water for San Luis Nat. Wildlife Refuges, Los Banos & Volta Wildlife Mgmt Area, and the Grassland RCD: seasonal marsh, permanent and semipermanent marsh or brood pond, managed riparian, upland, and reverse-cycle wetlands.

**Table A.10.3. Quantified Targeted Benefit Change, Sub-Region 10,
Valley Floor west of San Joaquin River**

TB # (1) [duplicate]	Reference Condition		Quantified Targeted Benefit		Quantified Targeted Benefit Change			Specific Time-Frame (11)
	Data Source (8)	Availability (9)	Data Source (8)	Data Availability (9)	Data Source (8)	Availability (9)	Range of Values (10)	
92	CVGSM	Unproven-precise	ERPP	Rough estimate	Calculated	Rough estimate	TBD	Apr/May 10 day dry/nrm yr
93 [115, 134, 150]	TBD	TBD	TBD	Proven - precise	Calculated	TBD	TBD	TBD
95	RWQCB	Proven - precise	RWQCB	Proven - precise	Calculated	Proven - precise	TBD	TBD
96	RWQCB	Proven - precise	RWQCB	Proven - precise	Calculated	Proven - precise	TBD	TBD
97	RWQCB	Proven - precise	RWQCB	Proven - precise	Calculated	Proven - precise	TBD	TBD
98 [79]	RWQCB	Proven - precise	RWQCB	Proven - precise	Calculated	Proven - precise	TBD	TBD
99	TBD	TBD	TBD	Proven - precise	Calculated	TBD	TBD	TBD
100	TBD	TBD	TBD	Proven - precise	Calculated	TBD	TBD	TBD
101 [82, 120, 137, 152]	TBD	TBD	TBD	Proven - precise	Calculated	TBD	TBD	TBD
102	RWQCB	Proven - precise	RWQCB	Proven - precise	Calculated	Proven - precise	TBD	TBD
103	RWQCB	Proven - precise	RWQCB	Proven - precise	Calculated	Proven - precise	TBD	TBD
104 [123, 140, 154]	RWQCB	Proven - precise	RWQCB	Proven - precise	Calculated	Proven - precise	TBD	Apr - Aug Sep - Mar
106	CVGSM/Core	Rough estimate	Core	Rough estimate	Calculated	Rough estimate	49 - 111 TAF/yr	Irrigation season
107	CVGSM	Unproven-precise	Core	Rough estimate	Calculated	Rough estimate	8.7 TAF/yr	TBD
108	CVGSM	Unproven-precise	Core	Rough estimate	Calculated	Rough estimate	2.3 TAF/yr	TBD
109	Core	Rough estimate	Core	Rough estimate	Calculated	Rough estimate	TBD	Irrigation season
110 [129, 146, 160]	CVHJVIP	Insufficient	CVHJVIP	Unproven - precise	Not available	Insufficient	Not available	Not available
111	RWS (ICP)	Insufficient	RWS (ICP)	Unproven - precise	Not available	Insufficient	Not available	Not available

**Table A.10.4. Quantifiable Objective, Sub-Region 10,
Valley Floor west of San Joaquin River**

TB # (1) [duplicate]	Achievable Agricultural Potential (12)	Quantifiable Objective (13)
92	TBD	TBD
93 [115, 134, 150]	TBD	TBD
95	TBD	TBD
96	TBD	TBD
97	TBD	TBD
98 [79]	TBD	TBD
99	TBD	TBD
100	TBD	TBD
101 [82, 120, 137, 152]	TBD	TBD
102	TBD	TBD
103	TBD	TBD
104 [123, 140, 154]	TBD	TBD
106	49 - 111 TAF per year	49 - 111 TAF per year
107	8.7 TAF per year plus additional water generated through reduction in application through improved irrigation systems	8.7 TAF per year plus additional water generated through reduction in application through improved irrigation systems
108	2.3 TAF per year	2.3 TAF per year
109	TBD	TBD
110 [129, 146, 160]	TBD	TBD
111	TBD	TBD

**Table A.10.5. Affected Flow Paths and Possible Actions, Sub-Region 10,
Valley Floor west of San Joaquin River**

TB # (1) [duplicate]	Affected Flow Paths (14)	Possible Actions (provided as examples; proposers are encouraged to consider local actions that are not listed) (15)
92	TBD	TBD
93 [115, 134, 150]	TBD	TBD
95	TBD	TBD
96	Surface and Groundwater Return	Improve farm irrigation management (such as irrigation scheduling) and more uniform irrigation methods (such as shorter furrows, sprinkler, or drip).
97	TBD	TBD
98 [79]	Surface and Groundwater Return	Improve farm irrigation management (such as irrigation scheduling) and more uniform irrigation methods (such as shorter furrows, sprinkler, or drip).
99	TBD	TBD
100	TBD	TBD
101 [82, 120, 137, 152]	Surface and Groundwater Return	cover crop, furrow or field diking and reduction in late season irrigation. Note: significant contributions to this TB can also be made through changes in chemical applications that are outside the scope of AgWUE.
102	TBD	TBD
103	Surface and Groundwater Return	Improve farm irrigation management (such as irrigation scheduling) and more uniform irrigation methods (such as shorter furrows, sprinkler, or drip).
104 [123, 140, 154]	Surface and Groundwater Return	Improve farm irrigation management (such as irrigation scheduling) and more uniform irrigation methods (such as shorter furrows, sprinkler, or drip).
106	Surface and Groundwater Return	Improve farm irrigation management (such as irrigation scheduling) and more uniform irrigation methods (such as shorter furrows, sprinkler, or drip).
107	ETAW	Reduce ET flows using improved irrigation methods, such as drip irrigation, and planting densities.
108	Surface water return and Percolation to Groundwater:	Improve farm irrigation management (such as irrigation scheduling) and more uniform irrigation methods (such as shorter furrows, sprinkler, or drip). Reduction in operational spill through improved management, canal automation or regulatory storage. Reduction in canal seepage through canal lining or piping.
109	TBD	TBD
110 [129, 146, 160]	TBD	TBD
111	TBD	TBD

Detail 106, Reduce Groundwater Flows to Salt Sinks

1. Quantified Targets

Reduce unwanted flows to salt sinks in Subregion 10

2. Reference Condition

A. Groundwater Return Sub-Region 10 * Step 4. (outflow, recoverable)

source: CVGSM Sub-Region 10

	Thousand Acre Feet												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	1.6	5.0	7.4	12.0	14.5	17.0	18.6	17.1	10.8	12.9	5.5	1.9	124.4
2) Dry	2.4	5.4	9.0	15.4	18.7	22.3	25.0	22.6	13.5	13.7	5.9	2.0	155.8
3) B Norm	2.1	4.9	9.1	15.9	19.3	23.1	26.1	23.5	13.8	12.7	5.5	1.8	157.9
4) A Norm	2.5	5.4	9.5	16.7	20.2	24.3	27.5	24.7	14.4	13.8	5.9	2.1	166.9
5) Wet	2.6	5.6	9.5	16.7	20.2	24.3	27.6	24.8	14.4	14.1	6.1	2.1	168.0
Wtd Avg.	2.2	5.2	8.8	15.1	18.3	21.8	24.5	22.1	13.2	13.4	5.8	2.0	152.3

3. Quantified Targeted Benefit Change

A. Quantified Targeted Benefit Change for Sub-Region 10

source: DWR - San Joaquin Valley Drainage Monitoring Program (December, 1998)

	Acre Feet												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
All Year													
Types			6179	6179	6179	6179	6179	6179	6179	6179	0	0	49432

4. Area Affected By Targeted Benefit

A. Ratio of Tiled Acres to Total Acres in Subregion

source: DWR - San Joaquin Valley Drainage Monitoring Program (December, 1998)

Tiled Acres	Total Acres in Subregion	Tiled as Percent of Total
90,000	698,996	12.9%

5. Water Balance - Flow Path Elements

A. Rain Sub-Region 10 * Step 4. (inflow)

source: CVGSM Sub-Region 10

	Flow Path Not Affected Thousand Acre Feet												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	5.3	4.4	3.0	2.3	1.4	0.5	0.0	0.2	0.8	1.1	2.5	3.7	25.2
2) Dry	4.5	5.0	5.5	2.2	1.4	0.1	0.1	0.1	0.8	1.9	4.6	4.2	30.4
3) B Norm	7.1	7.6	4.4	3.7	1.5	0.2	0.0	0.0	0.1	1.6	5.9	6.8	38.8
4) A Norm	6.9	7.6	7.1	3.9	0.5	0.1	0.1	0.2	0.4	2.6	4.6	8.5	42.5
5) Wet	10.9	8.4	8.8	6.3	1.1	0.1	0.0	0.0	2.1	2.3	5.8	9.6	55.7
Wtd Avg.	6.7	6.4	5.5	3.5	1.2	0.2	0.0	0.1	0.8	1.9	4.5	6.3	37.0

B. Surface Water Diversions Sub-Region 10 * Step 4. (inflow)													Flow Path Not Affected
source: CVGSM Sub-Region 10													Thousand Acre Feet
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.0	0.1	1.4	2.7	4.5	4.6	5.4	4.8	2.7	0.8	0.1	0.0	27.1
2) Dry	0.0	0.1	1.3	2.6	4.2	4.4	5.1	4.6	2.6	0.8	0.0	0.0	25.8
3) B Norm	0.0	0.1	1.3	2.6	4.2	4.4	5.1	4.6	2.6	0.8	0.0	0.0	25.7
4) A Norm	0.0	0.1	1.3	2.5	4.1	4.3	5.0	4.5	2.6	0.8	0.0	0.0	25.3
5) Wet	0.0	0.1	1.3	2.4	3.9	4.1	4.7	4.3	2.4	0.7	0.0	0.0	23.9
Wtd Avg.	0.0	0.1	1.3	2.6	4.2	4.4	5.1	4.6	2.6	0.8	0.1	0.0	25.7

C. Import Sub-Region 10 * Step 4. (inflow)													Flow Path Not Affected
source: CVGSM Sub-Region 10													Thousand Acre Feet
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	2.2	5.0	7.4	12.0	14.5	17.0	18.6	17.1	10.8	12.9	5.5	1.9	125.0
2) Dry	2.4	5.4	9.0	15.4	18.7	22.3	25.0	22.6	13.5	13.7	5.9	2.0	155.8
3) B Norm	2.1	4.9	9.1	15.9	19.3	23.1	26.1	23.5	13.8	12.7	5.5	1.8	157.9
4) A Norm	2.5	5.4	9.5	16.7	20.2	24.3	27.5	24.7	14.4	13.8	5.9	2.1	166.9
5) Wet	2.6	5.6	9.5	16.7	20.2	24.3	27.6	24.8	14.4	14.1	6.1	2.1	168.0
Wtd Avg.	2.3	5.2	8.8	15.1	18.3	21.8	24.5	22.1	13.2	13.4	5.8	2.0	152.5

D. Groundwater Pumping Sub-Region 10 * Step 4. (inflow)													Flow Path Not Affected
source: CVGSM Sub-Region 10													Thousand Acre Feet
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.1	0.1	16.0	4.1	7.9	24.8	18.0	14.2	0.5	0.1	0.1	0.1	86.2
2) Dry	0.1	0.1	7.5	1.0	4.5	24.3	13.3	9.6	0.3	0.1	0.1	0.1	61.0
3) B Norm	0.1	0.1	4.5	0.7	2.3	24.3	13.3	8.9	0.3	0.1	0.1	0.1	54.8
4) A Norm	0.1	0.1	1.6	0.6	1.9	24.3	12.8	7.8	0.3	0.1	0.1	0.1	49.8
5) Wet	0.1	0.1	0.6	0.6	1.3	24.3	12.8	8.4	0.3	0.1	0.1	0.1	48.9
Wtd Avg.	0.1	0.1	6.9	1.6	3.9	24.5	14.3	10.1	0.3	0.1	0.1	0.1	62.2

E. ET Rain Sub-Region 10 * Step 4. (outflow, irrecoverable)													Flow Path Not Affected
source: CVGSM Sub-Region 10													Thousand Acre Feet
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	2.7	2.6	2.2	1.9	1.1	0.4	0.8	-0.1	5.8	-0.4	0.6	1.6	19.3
2) Dry	2.4	2.7	3.5	1.8	1.2	0.1	0.5	0.1	4.1	-0.5	1.4	2.0	19.3
3) B Norm	2.9	3.4	2.9	2.8	1.2	0.2	0.5	0.0	3.7	-0.3	1.4	2.1	20.9
4) A Norm	2.8	3.2	4.1	3.0	0.5	0.0	0.6	0.1	3.4	-0.1	2.0	2.2	21.9
5) Wet	3.2	3.3	4.7	4.2	1.0	0.1	0.5	0.0	4.0	-0.4	2.1	2.3	25.2
Wtd Avg.	2.8	3.0	3.4	2.7	1.0	0.2	0.6	0.0	4.3	-0.3	1.4	2.0	21.0

F. Runoff from Rain Sub-Region 10 * Step 4. (outflow, irrecoverable)													Flow Path Not Affected
source: CVGSM Sub-Region 10													Thousand Acre Feet
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	1.6	1.3	0.7	0.4	0.2	0.0	0.0	0.0	0.2	0.1	0.5	1.0	6.2
2) Dry	1.6	1.9	1.7	0.5	0.2	0.0	0.0	0.0	0.2	0.2	1.6	1.3	9.3
3) B Norm	3.1	3.5	1.0	0.9	0.3	0.0	0.0	0.0	0.0	0.1	2.2	2.9	14.0
4) A Norm	3.0	3.6	2.5	1.0	0.0	0.0	0.0	0.0	0.0	0.3	1.6	4.4	16.5
5) Wet	6.1	4.3	3.5	2.0	0.2	0.0	0.0	0.0	0.5	0.4	2.3	5.5	24.8
Wtd Avg.	2.9	2.8	1.8	0.9	0.2	0.0	0.0	0.0	0.2	0.2	1.5	2.8	13.3

G. ETAW Sub-Region 10 * Step 4. (outflow, irrecoverable)													Flow Path Not Affected
source: CVGSM Sub-Region 10													Thousand Acre Feet
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.5	1.5	5.7	10.1	16.0	25.0	31.0	26.4	10.8	10.2	2.9	0.7	140.7
2) Dry	0.8	1.4	4.4	10.1	15.9	25.2	31.3	26.2	12.5	10.5	2.2	0.3	141.0
3) B Norm	0.3	0.7	4.9	9.2	15.9	25.1	31.3	26.3	12.9	10.0	2.2	0.3	139.0
4) A Norm	0.4	0.9	3.7	9.0	16.6	25.3	31.2	26.1	13.2	10.1	1.6	0.1	138.2
5) Wet	0.0	0.8	3.1	7.8	16.1	25.3	31.3	26.2	12.6	10.5	1.6	0.0	135.2
Wtd Avg.	0.4	1.1	4.5	9.3	16.1	25.2	31.2	26.3	12.3	10.3	2.2	0.3	139.0

H. Export Sub-Region 10 * Step 4. (outflow, irrecoverable)													Thousand Acre Feet
source: CVGSM Sub-Region 10													Thousand Acre Feet
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.0	0.0	0.2	0.4	0.7	0.7	0.9	0.8	0.4	0.1	0.0	0.0	4.4
2) Dry	0.0	0.0	0.2	0.4	0.7	0.7	0.8	0.7	0.4	0.1	0.0	0.0	4.2
3) B Norm	0.0	0.0	0.2	0.4	0.7	0.7	0.8	0.7	0.4	0.1	0.0	0.0	4.2
4) A Norm	0.0	0.0	0.2	0.4	0.7	0.7	0.8	0.7	0.4	0.1	0.0	0.0	4.1
5) Wet	0.0	0.0	0.2	0.4	0.6	0.7	0.8	0.7	0.4	0.1	0.0	0.0	3.9
Wtd Avg.	0.0	0.0	0.2	0.4	0.7	0.7	0.8	0.7	0.4	0.1	0.0	0.0	4.2

I. Surface Water Return Sub-Region 10 * Step 4. (outflow, recoverable)													Thousand Acre Feet
source: CVGSM Sub-Region 10													Thousand Acre Feet
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.6	2.0	16.1	6.1	8.1	18.0	8.4	7.6	2.7	2.8	1.9	0.5	74.9
2) Dry	0.6	2.2	10.1	6.4	8.6	22.3	9.4	8.3	3.2	3.1	2.3	0.6	77.0
3) B Norm	0.5	2.3	7.4	7.0	7.2	23.0	10.3	8.3	3.2	2.9	2.1	0.4	74.7
4) A Norm	0.7	2.6	5.7	7.7	7.1	24.0	11.1	8.4	3.2	3.4	2.8	0.5	77.2
5) Wet	0.8	2.7	5.2	8.4	6.8	23.9	10.9	8.8	3.2	3.4	2.7	0.6	77.4
Wtd Avg.	0.6	2.3	9.5	7.0	7.6	21.9	9.9	8.2	3.1	3.1	2.3	0.5	76.2

J. Groundwater Return Sub-Region 10 * Step 4. (outflow, recoverable)													Thousand Acre Feet
source: CVGSM Sub-Region 10													Thousand Acre Feet
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	1.6	5.0	7.4	12.0	14.5	17.0	18.6	17.1	10.8	12.9	5.5	1.9	124.4
2) Dry	2.4	5.4	9.0	15.4	18.7	22.3	25.0	22.6	13.5	13.7	5.9	2.0	155.8
3) B Norm	2.1	4.9	9.1	15.9	19.3	23.1	26.1	23.5	13.8	12.7	5.5	1.8	157.9
4) A Norm	2.5	5.4	9.5	16.7	20.2	24.3	27.5	24.7	14.4	13.8	5.9	2.1	166.9
5) Wet	2.6	5.6	9.5	16.7	20.2	24.3	27.6	24.8	14.4	14.1	6.1	2.1	168.0
Wtd Avg.	2.2	5.2	8.8	15.1	18.3	21.8	24.5	22.1	13.2	13.4	5.8	2.0	152.3

K. Evaporation Flows Sub-Region 10 * Step 4. (outflow, irrecoverable)													Thousand Acre Feet
source: = .02 * (5.B + 5.C - 5.H)													Thousand Acre Feet
= .02 * (Surface Water Diversions + Imports - Exports)													Thousand Acre Feet
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.0	0.1	0.2	0.3	0.4	0.4	0.5	0.4	0.3	0.3	0.1	0.0	3.0
2) Dry	0.0	0.1	0.2	0.4	0.4	0.5	0.6	0.5	0.3	0.3	0.1	0.0	3.5
3) B Norm	0.0	0.1	0.2	0.4	0.5	0.5	0.6	0.5	0.3	0.3	0.1	0.0	3.6
4) A Norm	0.0	0.1	0.2	0.4	0.5	0.6	0.6	0.6	0.3	0.3	0.1	0.0	3.8
5) Wet	0.1	0.1	0.2	0.4	0.5	0.6	0.6	0.6	0.3	0.3	0.1	0.0	3.8
Wtd Avg.	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.5	0.3	0.3	0.1	0.0	3.5

L. Sub-Region Water Balance 10 * Step 4.

source: = Step 5.(A + B + C + D) - Step5. (E + F + G + H + I + J + K)
 = (Rain + Surface Water Diversions + Import + Groundwater Pumping) - (ET Rain +
 Runoff from Rain + ETAW + Export + Surface & Groundwater Return + Evapotranspiration)

	Thousand Acre Feet												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.5	-3.0	-4.5	-10.2	-12.7	-14.6	-18.2	-15.9	-16.2	-11.2	-3.3	0.0	-109.3
2) Dry	-0.9	-3.1	-5.8	-13.8	-16.9	-20.0	-24.2	-21.6	-17.0	-11.0	-2.9	0.1	-137.1
3) B Norm	0.3	-2.2	-6.5	-13.7	-17.7	-20.7	-25.2	-22.4	-17.6	-10.7	-1.9	1.3	-136.9
4) A Norm	0.0	-2.6	-6.4	-14.4	-18.9	-21.8	-26.4	-23.6	-17.4	-10.7	-3.3	1.4	-144.1
5) Wet	0.9	-2.6	-6.2	-13.8	-18.9	-21.9	-26.5	-23.6	-16.3	-11.1	-2.8	1.2	-141.6
Wtd Avg.	0.1	-2.7	-5.8	-13.0	-16.7	-19.4	-23.6	-21.0	-16.8	-10.9	-2.9	0.7	-132.0

M. Applied Water Ratio Sub-Region 10 * Step 4.

source: = Step 5.G / Step 5 (B + C + D - H)
 = ETAW/(Surface Water Diversions + Import + Groundwater Pumping - Export)

	Thousand Acre Feet												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.2	0.3	0.2	0.5	0.6	0.5	0.8	0.7	0.8	0.7	0.5	0.4	6.4
2) Dry	0.3	0.3	0.2	0.5	0.6	0.5	0.7	0.7	0.8	0.7	0.4	0.1	5.9
3) B Norm	0.1	0.1	0.3	0.5	0.6	0.5	0.7	0.7	0.8	0.7	0.4	0.1	5.7
4) A Norm	0.2	0.2	0.3	0.5	0.7	0.5	0.7	0.7	0.8	0.7	0.3	0.0	5.4
5) Wet	0.0	0.1	0.3	0.4	0.7	0.5	0.7	0.7	0.8	0.7	0.2	0.0	5.1
Wtd Avg.	0.2	0.2	0.3	0.5	0.6	0.5	0.7	0.7	0.8	0.7	0.4	0.2	5.8

N. Groundwater Check Sub-Region 10

source: = Step 5 (J - D)
 = Groundwater Return Flows - Groundwater Pumping

	Thousand Acre Feet												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	1.5	4.9	-8.7	7.9	6.6	-7.8	0.7	2.9	10.3	12.8	5.4	1.7	38.2
2) Dry	2.3	5.2	1.5	14.5	14.2	-2.0	11.8	13.0	13.2	13.5	5.7	1.9	94.9
3) B Norm	2.0	4.7	4.7	15.3	17.0	-1.2	12.8	14.6	13.6	12.5	5.3	1.7	103.1
4) A Norm	2.3	5.3	7.9	16.1	18.3	-0.1	14.8	17.0	14.1	13.6	5.8	1.9	117.1
5) Wet	2.4	5.5	8.9	16.1	18.9	0.0	14.8	16.4	14.1	14.0	6.0	2.0	119.0
Wtd Avg.	2.1	5.1	1.9	13.5	14.3	-2.7	10.2	12.0	12.8	13.3	5.6	1.9	90.1

6. Idealized Agricultural Potential

A. Export Adjustment

0% of Export (Step 5H.) water is available for flow/timing changes in Sub-Region Detail
 note: Import (Step 5C) and Export (Step 5H) are in the water balance. In this Step (7D) Export water
 is considered water that flows through districts in Sub-Regions 4, 5, and 7. This water is available
 to make flow/timing changes

source: CVGSM Sub-Region Detail	Thousand Acre Feet												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	---	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	---	---	0.0
2) Dry	---	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	---	---	0.0
3) B Norm	---	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	---	---	0.0
4) A Norm	---	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	---	---	0.0
5) Wet	---	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	---	---	0.0
Wtd Avg.	---	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	---	---	0.0

B. Idealized Agricultural Potential

source: = Step 5 ((B + C + D) + Step 6A. - Step 5 (G + H))

= Surface Water Diversions + Import + Groundwater Diversions) - (ETAW + Export
+ Export Adjustment)

	Thousand Acre Feet												Total
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
1) Critical	---	---	18.9	8.3	10.2	20.8	10.1	9.0	2.8	3.5	---	---	83.6
2) Dry	---	---	13.2	8.4	10.8	25.1	11.3	9.9	3.4	3.9	---	---	86.0
3) B Norm	---	---	9.8	9.6	9.2	26.0	12.4	10.0	3.4	3.5	---	---	83.9
4) A Norm	---	---	8.5	10.5	8.9	26.9	13.3	10.1	3.6	4.4	---	---	86.3
5) Wet	---	---	8.1	11.6	8.6	26.8	13.1	10.5	4.1	4.4	---	---	87.2
Wtd Avg.	---	---	12.3	9.5	9.6	24.8	11.9	9.8	3.4	3.9	---	---	85.3

Step 7 Achievable Agricultural Potential

A. Farm Demand

assumes farm loss fraction of 0.13 for Sub-Region 10, values vary by SubRegion

source: = ETAW / Farm High (1- loss fraction)

	Thousand Acre Feet												Total
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
1) Critical	---	---	6.5	11.6	18.3	28.7	35.6	30.3	12.4	11.8	---	---	155.2
2) Dry	---	---	5.0	11.7	18.3	29.0	35.9	30.1	14.4	12.1	---	---	156.5
3) B Norm	---	---	5.6	10.5	18.3	28.9	36.0	30.2	14.8	11.5	---	---	155.8
4) A Norm	---	---	4.2	10.3	19.1	29.1	35.8	30.1	15.1	11.6	---	---	155.4
5) Wet	---	---	3.6	8.9	18.5	29.0	35.9	30.1	14.4	12.0	---	---	152.6
Wtd Avg.	---	---	5.1	10.7	18.5	28.9	35.8	30.2	14.1	11.8	---	---	155.2

B. Groundwater Pumping after System Improvements

Existing Farm Efficiency for Sub-Region Detail = 0.70

source: = (1 - 0.7 * (1/0.7-1/(1-Farm Loss Fraction))) * Groundwater Pumping

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	---	---	12.9	3.3	6.4	20.0	14.5	11.4	0.4	0.1	---	---	68.9
2) Dry	---	---	6.0	0.8	3.6	19.6	10.7	7.7	0.2	0.1	---	---	48.7
3) B Norm	---	---	3.6	0.5	1.8	19.6	10.7	7.2	0.2	0.1	---	---	43.7
4) A Norm	---	---	1.3	0.5	1.5	19.6	10.3	6.2	0.2	0.1	---	---	39.7
5) Wet	---	---	0.5	0.5	1.0	19.6	10.3	6.8	0.2	0.1	---	---	39.0
Wtd Avg.	---	---	5.5	1.3	3.2	19.7	11.5	8.1	0.3	0.1	---	---	49.7

C. Farm Demand not met by Groundwater Pumping

source: = Step 7.A - Step 7.B

= Farm Demand - Groundwater Pumping

	Thousand Acre Feet												Total
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
1) Critical	---	---	-6.4	8.3	12.0	8.7	21.1	18.9	12.0	11.7	---	---	86.3
2) Dry	---	---	-1.0	10.9	14.7	9.5	25.3	22.4	14.2	12.0	---	---	107.9
3) B Norm	---	---	2.0	10.0	16.4	9.3	25.3	23.0	14.6	11.4	---	---	112.1
4) A Norm	---	---	3.0	9.8	17.6	9.5	25.6	23.8	14.9	11.5	---	---	115.7
5) Wet	---	---	3.1	8.4	17.5	9.5	25.6	23.4	14.2	11.9	---	---	113.6
Wtd Avg.	---	---	-0.4	9.4	15.3	9.3	24.3	22.1	13.8	11.7	---	---	105.5

D. Water Supplier Delivery to Meet Farm Demand

assumes district loss fraction of 0.08

source: = Step 7C / District High (1- loss fraction)

= Farm Demand not met by Groundwater Pumping/(1 - 0.08)

	Thousand Acre Feet												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	---	---	-6.9	9.0	13.0	9.5	23.0	20.6	13.0	12.7	---	---	93.8
2) Dry	---	---	-1.1	11.8	15.9	10.3	27.5	24.4	15.4	13.0	---	---	117.2
3) B Norm	---	---	2.2	10.9	17.9	10.1	27.5	25.0	15.8	12.4	---	---	121.8
4) A Norm	---	---	3.2	10.7	19.1	10.4	27.8	25.9	16.2	12.5	---	---	125.7
5) Wet	---	---	3.4	9.1	19.0	10.3	27.9	25.4	15.5	13.0	---	---	123.5
Wtd Avg.	---	---	-0.4	10.3	16.7	10.1	26.4	24.0	15.0	12.7	---	---	114.7

E. Achievable Agricultural Potential

source = Step 5.(B + C - H) + Step 6A - Step 7D.

= Surface Water Diversions + Import - Export + Export Adjustment - Water Supplier
Delivery to Meet Farm Demand

	Thousand Acre Feet												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	---	---	15.5	5.3	5.2	11.4	0.2	0.7	0.0	0.9	---	---	39.1
2) Dry	---	---	11.2	5.8	6.3	15.7	1.8	2.1	0.3	1.2	---	---	44.4
3) B Norm	---	---	8.1	7.2	4.9	16.7	2.9	2.4	0.2	0.9	---	---	43.3
4) A Norm	---	---	7.4	8.2	4.5	17.5	4.0	2.6	0.3	1.9	---	---	46.4
5) Wet	---	---	7.2	9.6	4.5	17.4	3.7	2.9	0.9	1.8	---	---	48.0
Wtd Avg.	---	---	10.3	7.0	5.1	15.4	2.3	2.0	0.3	1.3	---	---	43.9

F. Groundwater Check after System Improvements

source = (0.13 * 0.80 * ETAW) + (0.04*(Farm Demand w/o Groundwater
- Water Supplier Delivery)) - Groundwater Pumping

	Thousand Acre Feet												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	---	---	-16.0	-3.9	-7.4	-23.8	-16.4	-11.7	2.7	2.6	---	---	-73.9
2) Dry	---	---	-7.4	-0.8	-4.1	-23.3	-11.7	-7.0	2.9	2.6	---	---	-48.9
3) B Norm	---	---	-4.4	-0.6	-1.8	-23.4	-11.7	-6.4	3.0	2.6	---	---	-42.9
4) A Norm	---	---	-1.5	-0.6	-1.5	-23.4	-11.2	-5.2	2.9	2.5	---	---	-38.0
5) Wet	---	---	-0.6	-0.6	-1.0	-23.6	-11.2	-5.9	2.9	2.6	---	---	-37.3
Wtd Avg.	---	---	-6.8	-1.5	-3.5	-23.5	-12.7	-7.6	2.9	2.6	---	---	-50.2

Step 8. Quantifiable Objective

source =min(Step 3A Wtd Avg, Step 7E)

	Thousand Acre Feet												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Wtd Avg	---	---	6.2	6.2	5.1	6.2	2.3	2.0	0.3	1.3	---	---	43.9

Detail 107, Decrease Nonproductive ET, SubRegion 10

Step 1. Quantified Targets

A. Acreage Assumed for Reduction of Nonproductive ET

source: CVGSM Sub-Region 10

Crop	Potential for ET Red.	Existing	Assumed for ET Reduction*	
			acres	percent
Pasture	No	19,000	0	0%
Alfalfa	No	58,500	0	0%
Sugar Beet	No	19,100	0	0%
Field	No	48,900	0	0%
Rice	No	6,500	0	0%
Truck	Yes	79,300	23,790	30%
Tomato	Yes	40,400	12,120	30%
Orchard	Yes	36,600	10,980	30%
Grains	No	15,200	0	0%
Vineyard	Yes	900	270	30%
Cotton	No	105,000	0	0%
Citrus and Olives	Yes	100	30	30%
Total		429,500	47,190	11%

*The Assumed Acreage for ET Reduction is 30% of the crops that have the Potential for ET Reduction.

B. Existing ET for Sub-Region 10

source: CVGSM

Crop													Inches
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Pasture	---	---	---	---	---	---	---	---	---	---	---	---	---
Alfalfa	---	---	---	---	---	---	---	---	---	---	---	---	---
Sugar Beet	---	---	---	---	---	---	---	---	---	---	---	---	---
Field	---	---	---	---	---	---	---	---	---	---	---	---	---
Rice	---	---	---	---	---	---	---	---	---	---	---	---	---
Truck	0.00	0.00	0.00	1.40	2.20	3.90	3.70	2.70	1.80	1.20	0.00	0.00	16.90
Tomato	0.00	0.00	0.00	1.10	3.40	7.10	8.40	6.20	2.40	0.00	0.00	0.00	28.60
Orchard	0.90	1.70	1.80	3.00	5.20	6.40	7.10	6.10	4.00	2.30	1.00	0.70	40.20
Grains	---	---	---	---	---	---	---	---	---	---	---	---	---
Vineyard	0.00	0.00	0.00	1.10	3.70	5.80	6.60	5.50	3.50	1.30	0.00	0.00	27.50
Cotton	---	---	---	---	---	---	---	---	---	---	---	---	---
Citrus and Olives	0.00	0.00	1.90	2.70	4.20	4.80	5.00	4.20	2.80	2.00	0.00	0.00	27.60
Total	0.21	0.40	0.42	1.69	3.22	5.32	5.72	4.41	2.48	1.15	0.23	0.16	25.39

C. ET from Rain for Sub-Region 10

source: CVGSM

													Inches
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.59	0.57	0.47	0.42	0.24	0.08	0.18	0.00	1.27	0.00	0.13	0.34	4.29
2) Dry	0.53	0.59	0.75	0.40	0.25	0.02	0.11	0.01	0.89	0.00	0.31	0.44	4.29
3) B Norm	0.63	0.75	0.64	0.61	0.25	0.05	0.11	0.00	0.81	0.00	0.30	0.45	4.58
4) A Norm	0.61	0.70	0.90	0.65	0.10	0.01	0.13	0.03	0.74	0.00	0.44	0.48	4.79
5) Wet	0.70	0.72	1.02	0.92	0.21	0.02	0.12	0.01	0.87	0.00	0.46	0.50	5.55
Wtd Avg.	0.61	0.65	0.73	0.58	0.21	0.04	0.14	0.01	0.94	0.00	0.31	0.43	4.64

D. Existing ETAW for Sub-Region 10

source: calculated = Step 1B.(Average Total) - Step 1C., (set to 0 if Step 1B. - Step 1C. <0)													Inches
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.00	0.00	0.00	1.28	2.98	5.23	5.53	4.41	1.21	1.15	0.10	0.00	21.88
2) Dry	0.00	0.00	0.00	1.29	2.97	5.29	5.60	4.39	1.59	1.15	0.00	0.00	22.29
3) B Norm	0.00	0.00	0.00	1.09	2.96	5.27	5.61	4.41	1.67	1.15	0.00	0.00	22.15
4) A Norm	0.00	0.00	0.00	1.04	3.12	5.31	5.58	4.38	1.74	1.15	0.00	0.00	22.31
5) Wet	0.00	0.00	0.00	0.78	3.01	5.30	5.60	4.40	1.60	1.15	0.00	0.00	21.83
Wtd Avg.	0.00	0.00	0.00	1.12	3.01	5.28	5.58	4.40	1.54	1.15	0.03	0.00	22.09

E. Target ETAW for Sub-Region 10

source: calculated = Step 1D. * 90%													Inches
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.00	0.00	0.00	1.15	2.68	4.71	4.98	3.97	1.09	1.03	0.09	0.00	19.70
2) Dry	0.00	0.00	0.00	1.16	2.67	4.76	5.04	3.95	1.43	1.03	0.00	0.00	20.06
3) B Norm	0.00	0.00	0.00	0.98	2.67	4.74	5.05	3.97	1.50	1.03	0.00	0.00	19.93
4) A Norm	0.00	0.00	0.00	0.94	2.80	4.78	5.02	3.94	1.56	1.03	0.00	0.00	20.08
5) Wet	0.00	0.00	0.00	0.70	2.71	4.77	5.04	3.96	1.44	1.03	0.00	0.00	19.65
Wtd Avg.	0.00	0.00	0.00	1.01	2.71	4.75	5.02	3.96	1.38	1.03	0.02	0.00	19.88

Step 2. Reference Condition

For ET Reduction the Reference Condition is the existing Crop ET, Step 1B.

Step 3. Quantified Targeted Benefit Change

A. Quantified Targeted Benefit Change for Sub-Region 10

source: calculated = Step 1D - Step 1E													Inches
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	---	---	---	0.13	0.30	0.52	0.55	0.44	0.12	0.11	---	---	2.18
2) Dry	---	---	---	0.13	0.30	0.53	0.56	0.44	0.16	0.11	---	---	2.23
3) B Norm	---	---	---	0.11	0.30	0.53	0.56	0.44	0.17	0.11	---	---	2.21
4) A Norm	---	---	---	0.10	0.31	0.53	0.56	0.44	0.17	0.11	---	---	2.23
5) Wet	---	---	---	0.08	0.30	0.53	0.56	0.44	0.16	0.11	---	---	2.18
Wtd Avg.	---	---	---	0.11	0.30	0.53	0.56	0.44	0.15	0.11	---	---	2.21

B. Quantified Targeted Benefit Change for Sub-Region 10

source: calculated = Step 1D - Step 1E													Thousand Acre Feet
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	---	---	---	0.50	1.17	2.06	2.18	1.73	0.48	0.45	---	---	8.6
2) Dry	---	---	---	0.51	1.17	2.08	2.20	1.73	0.63	0.45	---	---	8.8
3) B Norm	---	---	---	0.43	1.16	2.07	2.20	1.73	0.66	0.45	---	---	8.7
4) A Norm	---	---	---	0.41	1.23	2.09	2.20	1.72	0.68	0.45	---	---	8.8
5) Wet	---	---	---	0.31	1.18	2.08	2.20	1.73	0.63	0.45	---	---	8.6
Wtd Avg.	---	---	---	0.44	1.18	2.08	2.19	1.73	0.60	0.45	---	---	8.7

Step 4. Area Affected by Targeted Benefit

Area affected are the 47,190 acres identified in Step 1A.

Step 5. Water Flow Path Elements

The flow path elements used in this analysis are given in Step 1.

Step 6. Idealized Agricultural Potential

Additional ET research is required to determine this component.

Step 7. Achievable Agricultural Potential

The farm Available Agricultural Potential is the same as Step 3B.

Step 8. Quantifiable Objective

A. For ET Reduction the Quantifiable Objective is Step 3B

Detail 110, Provide long-term diversion flexibility to increase the water supply for beneficial uses.

Step 1. Quantified Targets

A. Percentage of Subregion 10 in each Wetland Region

source: GIS analysis

Basin	Basin Acres	Sub-Region 10 Acres	Ratio Acreage in Sub-Region to Total Acreage
Colusa	1,100,765	1	--
Butte	574,618	1	--
Sutter	224,142	1	--
American	517,893	1	--
Yolo	514,963	1	--
Delta	1,332,584	23,463	0.02
Suisun	99,311	1	--
San Joaquin	1,877,034	547,288	0.29
Tulare	3,523,884	19,446	--

B. Annual Water Need for Optimum Habitat by Wetland Type

source: Central Valley Wetlands Water Supply Investigations (August, 2000)

Basin	Seasonal Wetlands	Semi-Permanent Wetlands	Permanent Wetlands	Annual Total
-----Acre Feet-----				
Colusa	43,435	7,563	6,771	57,769
Butte	72,923	11,337	10,150	94,410
Sutter	469	81	73	622
American	5,695	992	888	7,575
Yolo	25,755	4,484	4,015	34,254
Delta	10,053	1,843	1,650	13,546
Suisun	119,995	21,993	19,690	161,677
San Joaq.	188,480	20,663	15,856	225,000
Tulare	15,640	1,854	1,415	18,908

C. Fraction of Water Need Requirements by Month as a Percentage of Total Water Need- Seasonal Wetlands

source: Central Valley Wetlands Water Supply Investigations (August, 2000)

Basin	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Colusa	0.04	0.04	0.04	0.00	0.14	0.00	0.00	0.18	0.36	0.08	0.08	0.04	1.0
Butte	0.04	0.04	0.04	0.00	0.18	0.00	0.00	0.16	0.36	0.09	0.07	0.04	1.0
Sutter	0.04	0.04	0.04	0.00	0.14	0.00	0.00	0.18	0.36	0.08	0.08	0.04	1.0
American	0.04	0.04	0.04	0.00	0.14	0.00	0.00	0.18	0.36	0.08	0.08	0.04	1.0
Yolo	0.04	0.04	0.04	0.00	0.14	0.00	0.00	0.18	0.36	0.08	0.08	0.04	1.0
Delta	0.04	0.04	0.04	0.05	0.00	0.00	0.00	0.19	0.42	0.08	0.08	0.04	1.0
Suisun	0.04	0.04	0.04	0.05	0.00	0.00	0.00	0.19	0.42	0.08	0.08	0.04	1.0
San Joaq.	0.04	0.04	0.00	0.00	0.15	0.05	0.00	0.15	0.38	0.08	0.08	0.04	1.0
Tulare	0.04	0.04	0.00	0.15	0.00	0.11	0.00	0.09	0.38	0.08	0.08	0.04	1.0

D. Fraction of Water Need Requirements by Month as a Percentage of Total Water Need- Semi-Permanent Wetlands
source: Central Valley Wetlands Water Supply Investigations (August, 2000)

Basin	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Colusa	0.03	0.03	0.05	0.07	0.07	0.14	0.14	0.00	0.00	0.41	0.05	0.03	1.0
Butte	0.03	0.03	0.05	0.07	0.07	0.14	0.14	0.00	0.00	0.41	0.05	0.03	1.0
Sutter	0.03	0.03	0.05	0.07	0.07	0.14	0.14	0.00	0.00	0.41	0.05	0.03	1.0
American	0.03	0.03	0.05	0.07	0.07	0.14	0.14	0.00	0.00	0.41	0.05	0.03	1.0
Yolo	0.03	0.03	0.05	0.07	0.07	0.14	0.14	0.00	0.00	0.41	0.05	0.03	1.0
Delta	0.03	0.03	0.05	0.07	0.07	0.14	0.14	0.00	0.00	0.41	0.05	0.03	1.0
Suisun	0.03	0.03	0.05	0.07	0.07	0.14	0.14	0.00	0.00	0.41	0.05	0.03	1.0
San Joa.	0.03	0.03	0.05	0.07	0.07	0.14	0.14	0.00	0.00	0.41	0.05	0.03	1.0
Tulare	0.03	0.04	0.06	0.08	0.08	0.13	0.13	0.00	0.00	0.38	0.06	0.04	1.0

E. Fraction of Water Need Requirements by Month as a Percentage of Total Water Need- Permanent Wetlands
source: Central Valley Wetlands Water Supply Investigations (August, 2000)

Basin	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Colusa	0.02	0.02	0.04	0.08	0.11	0.15	0.15	0.15	0.13	0.08	0.06	0.02	1.0
Butte	0.02	0.02	0.04	0.08	0.11	0.15	0.15	0.15	0.13	0.08	0.06	0.02	1.0
Sutter	0.02	0.02	0.04	0.08	0.11	0.15	0.15	0.15	0.13	0.08	0.06	0.02	1.0
American	0.02	0.02	0.04	0.08	0.11	0.15	0.15	0.15	0.13	0.08	0.06	0.02	1.0
Yolo	0.02	0.02	0.04	0.08	0.11	0.15	0.15	0.15	0.13	0.08	0.06	0.02	1.0
Delta	0.02	0.02	0.04	0.08	0.11	0.15	0.15	0.15	0.13	0.08	0.06	0.02	1.0
Suisun	0.02	0.02	0.04	0.08	0.11	0.15	0.15	0.15	0.13	0.08	0.06	0.02	1.0
San Joa.	0.02	0.02	0.04	0.08	0.11	0.15	0.15	0.15	0.13	0.08	0.06	0.02	1.0
Tulare	0.02	0.02	0.04	0.08	0.11	0.15	0.15	0.15	0.13	0.08	0.06	0.02	1.0

F. Target Water Application for Private Wetlands in Sub-Region 10

source: calculated using Step1A through Step 1E

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Seasonal	2.1	2.1	0.0	0.0	8.4	2.6	-	8.4	21.0	4.2	4.2	2.1	55.1
Semi-Perman	0.2	0.2	0.3	0.4	0.4	0.8	0.8	-	-	2.5	0.3	0.2	6.1
Permanent	0.1	0.1	0.2	0.4	0.5	0.7	0.7	0.7	0.6	0.4	0.3	0.1	4.7
Total	2.4	2.4	0.5	0.8	9.3	4.1	1.5	9.1	21.6	7.0	4.8	2.4	65.8

Step 2. Reference Condition

A. Annual Available Water Supply by Wetland Type

source: Central Valley Wetlands Water Supply Investigations

Basin	Wetlands	Wetlands	Permanent Wetlands	Total
	-----Acre Feet-----			
Colusa	36,601	6,625	6,101	49,327
Butte	57,797	9,261	8,667	75,725
Sutter	355	66	62	483
American	4,328	804	754	5,886
Yolo	25,755	4,484	4,015	34,254
Delta	10,053	1,843	1,650	13,546
Suisun	119,995	21,993	19,690	161,678
San Joaquin	181,676	19,922	15,403	217,001
Tulare	15,181	1,802	1,373	18,356

B. Available Water for Private Wetlands in Sub-Region 10

source: calculated based on Step 2A and steps 1A,1C,1D, and 1E

	Thousand Acre Feet												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Seasonal	2.0	2.0	0.0	0.0	8.1	2.5	-	8.1	20.3	4.1	4.1	2.0	53.1
Semi-Perm.	0.2	0.2	0.3	0.4	0.4	0.8	0.8	-	-	2.4	0.3	0.2	5.8
Permanent	0.1	0.1	0.2	0.3	0.5	0.7	0.7	0.7	0.6	0.3	0.3	0.1	4.5
Total	2.3	2.3	0.5	0.7	9.0	4.0	1.5	8.8	20.9	6.8	4.6	2.3	63.5

Step 3. Quantified Targeted Benefit Change

A. Additional Water Required for Optimum Management of Private Wetlands in Sub-Region

source: calculated: Step 1F- Step 2B

	Thousand Acre Feet												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Seasonal	0.1	0.1	-	-	0.3	0.1	-	0.3	0.8	0.2	0.2	0.1	2.0
Semi-Perm.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	0.1	0.0	0.0	0.2
Permanent	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total	0.1	0.1	0.0	0.0	0.3	0.1	0.0	0.3	0.8	0.2	0.2	0.1	2.3

Step 4. Area Affected By Targeted Benefit

This analysis assumes that all of the agricultural lands in the sub-region could potentially contribute to the provision of additional waters for wetlands.

Step 5. Water Flow Path Elements

A. Rain Sub-Region (inflow)

source: CVGSM Sub-Region 10

	Flow Path Not Affected Thousand Acre Feet												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	41.0	33.8	23.5	17.5	10.7	3.6	0.0	1.6	6.4	8.7	19.7	29.0	195.5
2) Dry	35.0	38.9	42.4	17.4	11.0	0.8	0.5	0.5	6.1	14.6	36.0	32.7	236.0
3) B Norm	55.0	58.9	33.8	28.6	11.7	1.6	0.0	0.0	0.7	12.0	45.9	53.0	301.3
4) A Norm	53.2	59.4	55.1	30.5	3.8	1.0	1.0	1.2	2.9	20.0	36.0	66.1	330.2
5) Wet	84.9	65.1	68.7	49.1	8.8	1.0	0.3	0.3	16.6	18.2	45.2	74.2	432.4
Wtd Avg.	51.7	49.4	43.1	27.1	9.1	1.7	0.4	0.8	6.3	14.4	34.8	48.9	287.6

B. Surface Water Diversions Sub-Region (inflow)

source: CVGSM Sub-Region 10

	Flow Path Not Affected Thousand Acre Feet												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.0	1.0	11.0	20.9	34.6	35.9	41.7	37.6	21.1	5.9	0.9	0.0	210.7
2) Dry	0.0	1.0	10.3	20.1	32.7	34.5	39.5	35.8	20.3	5.9	0.4	0.0	200.6
3) B Norm	0.0	1.0	10.4	20.1	32.5	34.2	39.4	35.6	20.4	5.9	0.4	0.0	199.9
4) A Norm	0.0	1.0	10.3	19.7	31.8	33.5	38.8	34.8	20.0	5.9	0.3	0.0	196.2
5) Wet	0.0	1.0	9.9	18.8	30.0	31.7	36.6	33.0	18.6	5.8	0.2	0.0	185.5
Wtd Avg.	0.0	1.0	10.5	20.0	32.5	34.2	39.4	35.6	20.2	5.9	0.5	0.0	199.8

C. Import Sub-Region (inflow)

source: CVGSM Sub-Region 10

	Thousand Acre Feet												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	17.1	39.0	57.2	93.3	112.8	132.1	144.6	133.1	83.6	100.4	43.1	14.5	970.8
2) Dry	18.8	41.6	69.7	119.9	145.1	173.0	194.4	175.7	104.7	106.1	45.6	15.8	1,210.3
3) B Norm	16.5	37.8	71.0	123.8	149.7	179.6	203.0	182.7	107.3	98.5	42.3	14.2	1,226.5
4) A Norm	19.2	42.2	73.8	129.8	156.8	188.4	213.9	192.1	111.5	107.0	46.1	16.0	1,296.6
5) Wet	19.9	43.4	73.8	129.9	157.0	188.7	214.2	192.4	111.6	109.8	47.2	16.5	1,304.5
Wtd Avg.	18.2	40.8	68.2	117.3	141.8	169.2	190.2	171.9	102.2	104.2	44.8	15.4	1,184.2

D. Groundwater Pumping Sub-Region (inflow)

source: CVGSM Sub-Region 10

source: CVGSM Sub-Region 10	Thousand Acre Feet												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	1.0	1.0	124.6	31.6	61.5	193.0	139.5	110.3	3.8	1.0	1.0	0.9	669.1
2) Dry	1.0	1.0	58.3	7.4	34.8	188.9	103.0	74.3	2.0	1.0	1.0	0.9	473.6
3) B Norm	1.0	1.0	34.8	5.2	17.5	188.9	103.3	69.4	2.0	1.1	1.0	0.9	426.0
4) A Norm	1.0	1.0	12.2	4.9	14.4	188.9	99.3	60.3	2.0	1.1	1.0	0.9	387.0
5) Wet	1.0	1.0	4.9	4.9	9.9	188.9	99.3	65.2	2.0	1.0	1.0	1.0	380.1
Wtd Avg.	1.0	1.0	53.3	12.5	30.6	190.0	111.2	78.4	2.4	1.0	1.0	0.9	483.3

E. ET Rain Sub-Region (outflow, irrecoverable)

source: CVGSM Sub-Region 10

ET Rain Sub-Region (outflow, irrecoverable) source: CVGSM Sub-Region 10											Flow Path Not Affected Thousand Acre Feet		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	21.3	20.3	16.7	14.9	8.6	3.0	6.6	-1.0	45.3	-3.0	4.8	12.1	149.5
2) Dry	18.9	21.0	26.8	14.3	8.9	0.8	4.1	0.5	31.7	-4.1	11.0	15.6	149.6
3) B Norm	22.5	26.7	22.8	21.8	9.1	1.6	3.9	0.0	29.0	-2.0	10.7	15.9	162.0
4) A Norm	21.7	25.1	32.2	23.4	3.6	0.2	4.8	1.0	26.5	-1.0	15.7	17.2	170.4
5) Wet	25.1	25.7	36.4	32.9	7.5	0.7	4.2	0.3	31.2	-2.9	16.6	17.9	195.6
Wtd Avg.	21.7	23.3	26.2	20.6	7.5	1.3	4.9	0.1	33.6	-2.6	11.3	15.5	163.4

F. Runoff from Rain Sub-Region (outflow, irrecoverable)

source: CVGSM Sub-Region 10

Runoff from Rain Sub-Region (outflow, irrecoverable) source: CVGSM Sub-Region 10											Flow Path Not Affected Thousand Acre Feet		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	12.7	10.3	5.2	3.4	1.8	0.2	0.0	0.2	1.4	0.8	3.8	8.2	47.9
2) Dry	12.8	14.6	13.3	3.8	1.8	0.0	0.0	0.0	1.3	1.8	12.5	10.2	72.1
3) B Norm	24.4	27.3	8.1	6.8	2.0	0.0	0.0	0.0	0.0	0.7	16.9	22.8	109.0
4) A Norm	23.4	28.2	19.3	7.9	0.2	0.0	0.0	0.0	0.2	2.6	12.4	33.9	128.1
5) Wet	47.5	33.2	27.3	15.3	1.3	0.0	0.0	0.0	4.2	2.9	17.6	43.0	192.3
Wtd Avg.	22.5	21.4	13.9	6.9	1.4	0.1	0.0	0.1	1.3	1.7	11.7	22.0	103.0

G. ETAW Sub-Region (outflow, irrecoverable)

source: CVGSM Sub-Region 10

ETAW Sub-Region (outflow, irrecoverable) source: CVGSM Sub-Region 10											Flow Path Not Affected Thousand Acre Feet		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	3.8	11.9	44.1	78.1	123.9	193.9	240.4	205.0	83.5	79.5	22.7	5.8	1,092.6
2) Dry	6.1	11.2	34.0	78.7	123.5	196.1	242.9	203.5	97.1	81.8	17.4	2.3	1,094.7
3) B Norm	2.6	5.5	38.1	71.3	123.3	195.2	243.1	204.0	99.9	77.8	16.9	2.0	1,079.6
4) A Norm	3.3	7.2	28.6	69.7	128.9	196.6	242.2	203.1	102.4	78.5	12.2	0.7	1,073.3
5) Wet	0.0	6.5	24.4	60.2	124.9	196.2	242.7	203.7	97.6	81.3	12.0	0.0	1,049.7
Wtd Avg.	3.4	8.9	34.6	72.5	125.0	195.5	242.1	203.9	95.2	79.8	16.7	2.4	1,079.9

H. Export Sub-Region (outflow, irrecoverable)

source: CVGSM Sub-Region 10

source: CVGSM Sub-Region 10													Thousand Acre Feet
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.0	0.2	1.8	3.4	5.6	5.8	6.7	6.1	3.4	1.0	0.1	0.0	34.0
2) Dry	0.0	0.2	1.7	3.3	5.3	5.6	6.4	5.8	3.3	1.0	0.1	0.0	32.4
3) B Norm	0.0	0.2	1.7	3.3	5.3	5.5	6.3	5.7	3.3	1.0	0.1	0.0	32.3
4) A Norm	0.0	0.2	1.7	3.2	5.1	5.4	6.3	5.6	3.2	1.0	0.1	0.0	31.7
5) Wet	0.0	0.2	1.6	3.0	4.9	5.1	5.9	5.3	3.0	0.9	0.0	0.0	29.9
Average	0.0	0.2	1.7	3.2	5.3	5.5	6.4	5.7	3.3	1.0	0.1	0.0	32.3

I. Surface Runoff Sub-Region (outflow, recoverable)

source: CVGSM Sub-Region 10

source: CVGSM Sub-Region 10	Thousand Acre Feet												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	5.0	15.3	124.7	47.5	62.8	139.8	65.4	59.3	21.3	22.1	14.7	4.0	581.8
2) Dry	4.6	17.1	78.5	49.6	66.5	173.1	73.1	64.4	24.5	24.0	18.2	4.6	598.2
3) B Norm	3.9	17.6	57.6	54.7	55.6	179.0	80.0	64.8	24.7	22.5	16.3	3.3	579.8
4) A Norm	5.5	20.0	43.9	60.1	55.1	186.4	86.1	65.6	25.1	26.5	21.5	4.1	599.9
5) Wet	6.2	21.1	40.3	65.4	53.0	185.5	84.3	68.3	25.1	26.4	21.1	4.6	601.3
Average	5.0	18.0	73.6	54.7	59.2	170.2	76.8	64.0	23.9	24.2	18.2	4.1	591.9

J. Percolation to Groundwater Sub-Region (outflow, recoverable)

source: CVGSM Sub-Region 10

source: CVGSM Sub-Region 10											Thousand Acre Feet		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	12.3	15.3	22.1	15.9	15.3	20.9	11.3	10.7	0.6	4.8	8.7	8.6	146.5
2) Dry	11.2	17.4	24.3	15.9	16.1	21.5	14.6	10.7	1.0	5.9	12.8	12.8	164.1
3) B Norm	17.9	21.8	19.8	19.2	15.0	21.1	15.6	10.7	0.3	5.2	13.3	15.6	175.7
4) A Norm	16.9	22.4	23.4	21.2	12.9	21.5	17.4	10.7	0.7	8.6	15.5	21.7	193.0
5) Wet	26.4	23.1	25.1	25.4	13.3	21.5	16.3	10.7	4.6	8.8	17.9	23.8	216.7
Average	16.2	19.6	22.9	19.1	14.6	21.3	14.8	10.7	1.3	6.5	13.2	15.8	176.1

K. Evaporation Flows Sub-Region

source: = 0.02 * (Step 5B + 5C - 5H)

= 0.02 * (Surface Water Diversion + Import - Export)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.3	0.8	1.3	2.2	2.8	3.2	3.6	3.3	2.0	2.1	0.9	0.3	22.9
2) Dry	0.4	0.8	1.6	2.7	3.5	4.0	4.5	4.1	2.4	2.2	0.9	0.3	27.6
3) B Norm	0.3	0.8	1.6	2.8	3.5	4.2	4.7	4.3	2.5	2.1	0.9	0.3	27.9
4) A Norm	0.4	0.9	1.6	2.9	3.7	4.3	4.9	4.4	2.6	2.2	0.9	0.3	29.2
5) Wet	0.4	0.9	1.6	2.9	3.6	4.3	4.9	4.4	2.5	2.3	0.9	0.3	29.2
Wtd Avg.	0.4	0.8	1.5	2.7	3.4	4.0	4.5	4.0	2.4	2.2	0.9	0.3	27.0

L. Sub-Region Water Balance

source: = Step 5.(A + B + C + D) - Step5. (E + F + G + H + I + J + K)

= (Rain + Surface Water Diversions + Import + Groundwater Pumping) - (ET Rain +
Runoff from Rain + ETAW + Export + Surface & Groundwater Return + Evaporation)

	Thousand Acre Feet												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	3.6	0.6	0.3	-2.1	-1.2	-2.2	-8.2	-0.9	-42.8	8.8	8.9	5.6	-29.4
2) Dry	0.7	0.2	0.7	-3.5	-2.0	-3.8	-8.2	-2.8	-28.4	14.9	10.2	3.6	-18.3
3) B Norm	0.8	-1.2	0.3	-2.0	-2.3	-2.3	-8.0	-1.8	-29.4	10.4	14.5	8.3	-12.7
4) A Norm	2.1	-0.3	0.7	-3.4	-2.7	-2.5	-8.7	-2.0	-24.3	15.6	5.1	5.2	-15.5
5) Wet	0.3	-0.2	0.4	-2.3	-2.9	-2.9	-7.8	-1.9	-19.5	15.0	7.4	2.2	-12.2
Wtd Avg.	1.7	-0.1	0.5	-2.7	-2.1	-2.7	-8.2	-1.8	-30.0	12.8	9.0	5.0	-18.7

M. Applied Water Ratio Sub-Region

source: = Step 5G / Step 5 (B + C + D - H)

= ETAW/(Surface Water Diversions + Import + Groundwater Pumping - Export)

	Thousand Acre Feet												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.21	0.29	0.23	0.55	0.61	0.55	0.75	0.75	0.80	0.75	0.51	0.37	0.60
2) Dry	0.31	0.26	0.25	0.55	0.60	0.50	0.73	0.73	0.79	0.73	0.37	0.14	0.59
3) B Norm	0.15	0.14	0.33	0.49	0.63	0.49	0.72	0.72	0.79	0.74	0.39	0.13	0.59
4) A Norm	0.17	0.16	0.30	0.46	0.65	0.48	0.70	0.72	0.79	0.69	0.26	0.04	0.58
5) Wet	0.00	0.14	0.28	0.40	0.65	0.49	0.71	0.71	0.76	0.70	0.25	0.00	0.57
Wtd Avg.	0.2	0.2	0.3	0.5	0.6	0.5	0.7	0.7	0.8	0.7	0.4	0.2	0.6

N. Groundwater Check Sub-Region

source: = Step 5 (J - D)

= Groundwater Return Flows - Groundwater Pumping

	Thousand Acre Feet												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	11.4	14.3	-102.5	-15.7	-46.2	-172.1	-128.2	-99.6	-3.2	3.8	7.8	7.6	-522.6
2) Dry	10.3	16.4	-34.0	8.4	-18.7	-167.4	-88.4	-63.6	-0.9	4.9	11.8	11.8	-309.4
3) B Norm	16.9	20.8	-14.9	14.0	-2.6	-167.8	-87.7	-58.6	-1.6	4.1	12.4	14.7	-250.3
4) A Norm	16.0	21.4	11.2	16.3	-1.5	-167.5	-81.9	-49.6	-1.3	7.5	14.5	20.8	-194.0
5) Wet	25.4	22.1	20.1	20.4	3.5	-167.5	-83.1	-54.5	2.6	7.8	16.9	22.8	-163.4
Wtd Avg.	15.3	18.6	-30.4	6.6	-16.0	-168.7	-96.4	-67.7	-1.1	5.5	12.2	14.9	-307.2

6. Idealized Agricultural Potential

A. Export Adjustment

0% of Export (Step 5H.) water is available for flow/timing changes in Sub-Region

note: Import (Step 5C) and Export (Step 5H) are in the water balance. In this Step (7D) Export water is considered water that flows through districts in Sub-Regions 4, 5, and 7. This water is available to make flow/timing changes

source: CVGSM Sub-Region												Thousand Acre Feet	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	---	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	---	---	0.0
2) Dry	---	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	---	---	0.0
3) B Norm	---	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	---	---	0.0
4) A Norm	---	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	---	---	0.0
5) Wet	---	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	---	---	0.0
Wtd Avg.	N/A	N/A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	N/A	N/A	0.0

B. Idealized Agricultural Potential

source: = Step 5 ((B + C + D) + Step 6A. - Step 5 (G + H))

= Surface Water Diversions + Import + Groundwater Diversions) - (ETAW + Export + Export Adjustment)

	Thousand Acre Feet												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	---	---	146.8	64.3	79.4	161.3	78.7	70.0	21.5	26.9	---	---	648.9
2) Dry	---	---	102.7	65.5	83.8	194.8	87.6	76.5	26.5	30.2	---	---	667.6
3) B Norm	---	---	76.4	74.7	71.1	201.9	96.3	77.9	26.5	26.8	---	---	651.7
4) A Norm	---	---	66.0	81.6	69.0	208.9	103.6	78.5	27.9	34.5	---	---	669.9
5) Wet	---	---	62.6	90.4	67.1	208.1	101.5	81.6	31.5	34.2	---	---	677.1
Wtd Avg.	N/A	N/A	95.7	74.1	74.7	192.4	92.4	76.3	26.3	30.4	N/A	N/A	662.2

7. Achievable Agricultural Potential

A. Farm Demand

assumes farm loss fraction of 0.13 for Sub-Region , values vary by SubRegion

source: = ETAW / Farm High (1- loss fraction)

	Thousand Acre Feet												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	---	---	50.7	89.8	142.4	222.8	276.3	235.6	96.0	91.4	---	---	1,205.2
2) Dry	---	---	39.1	90.5	141.9	225.4	279.2	233.9	111.7	94.0	---	---	1,215.7
3) B Norm	---	---	43.8	81.9	141.7	224.4	279.4	234.5	114.8	89.4	---	---	1,209.9
4) A Norm	---	---	32.9	80.1	148.1	226.0	278.4	233.4	117.7	90.2	---	---	1,206.8
5) Wet	---	---	28.0	69.2	143.6	225.5	279.0	234.1	112.2	93.5	---	---	1,185.2
Wtd Avg.	---	---	39.8	83.3	143.6	224.7	278.3	234.4	109.5	91.7	---	---	1,205.2

B. Groundwater Pumping after System Improvements

Existing Farm Efficiency for Sub-Region = 0.70
 source: = $(1 - 0.7 * (1/0.7 - 1/(1 - \text{Farm Loss Fraction}))) * \text{Groundwater Pumping}$

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	---	---	100.2	25.5	49.5	155.3	112.3	88.8	3.0	0.8	---	---	535.3
2) Dry	---	---	46.9	6.0	28.0	152.0	82.9	59.8	1.6	0.8	---	---	377.9
3) B Norm	---	---	28.0	4.2	14.1	152.0	83.1	55.8	1.6	0.9	---	---	339.6
4) A Norm	---	---	9.8	4.0	11.6	152.0	79.9	48.5	1.6	0.8	---	---	308.3
5) Wet	---	---	4.0	4.0	8.0	152.0	79.9	52.5	1.6	0.8	---	---	302.7
Wtd Avg.	---	---	42.9	10.0	24.6	152.9	89.5	63.1	2.0	0.8	---	---	385.7

C. Farm Demand not met by Groundwater Pumping

source: = Step 7.A - Step 7.B
 = Farm Demand - Groundwater Pumping

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	---	---	-49.5	64.4	92.9	67.6	164.1	146.9	93.0	90.6	---	---	669.9
2) Dry	---	---	-7.8	84.5	113.9	73.4	196.3	174.1	110.1	93.2	---	---	837.8
3) B Norm	---	---	15.8	77.7	127.6	72.4	196.3	178.7	113.2	88.5	---	---	870.3
4) A Norm	---	---	23.1	76.1	136.5	74.0	198.5	184.9	116.1	89.4	---	---	898.5
5) Wet	---	---	24.1	65.2	135.7	73.5	199.1	181.7	110.6	92.7	---	---	882.5
Wtd Avg.	---	---	-3.1	73.3	119.0	71.9	188.8	171.3	107.5	90.9	---	---	819.5

D. Water Supplier Delivery to Meet Farm Demand

assumes district loss fraction of 0.08
 source: = Step 7C / District High (1- loss fraction)
 = Farm Demand not met by Groundwater Pumping/(1 - 0.08)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	---	---	-53.8	70.0	101.0	73.4	178.3	159.6	101.0	98.5	---	---	728.2
2) Dry	---	---	-8.5	91.9	123.9	79.8	213.4	189.2	119.7	101.3	---	---	910.6
3) B Norm	---	---	17.2	84.5	138.7	78.7	213.3	194.2	123.1	96.2	---	---	945.9
4) A Norm	---	---	25.1	82.7	148.4	80.4	215.7	200.9	126.2	97.2	---	---	976.6
5) Wet	---	---	26.2	70.9	147.5	79.9	216.4	197.5	120.2	100.8	---	---	959.2
Wtd Avg.	---	---	-3.4	79.6	129.4	78.1	205.2	186.2	116.9	98.8	---	---	890.8

E. Achievable Agricultural Potential

source = Step 5.(B + C - H) + Step 6A - Step 7D.
 = Surface Water Diversions + Import - Export + Export Adjustment - Water Supplier
 Delivery to Meet Farm Demand

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	---	---	120.2	40.9	40.8	88.8	1.3	5.1	0.2	6.9	---	---	304.0
2) Dry	---	---	86.9	44.9	48.6	122.2	14.1	16.4	2.0	9.7	---	---	344.9
3) B Norm	---	---	62.6	56.2	38.2	129.5	22.7	18.4	1.3	7.3	---	---	336.2
4) A Norm	---	---	57.3	63.6	35.0	136.2	30.7	20.3	2.1	14.8	---	---	360.1
5) Wet	---	---	55.9	74.8	34.7	135.4	28.5	22.6	6.9	13.8	---	---	372.7
Wtd Avg.	---	---	80.3	54.5	39.7	119.8	18.0	15.6	2.2	10.3	---	---	340.6

F. Groundwater Check after System Improvements

$$\text{source} = (0.13 * 0.80 * \text{ETAW}) + (0.04 * (\text{Farm Demand w/o Groundwater} - \text{Water Supplier Delivery})) - \text{Groundwater Pumping}$$

	Thousand Acre Feet												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	---	---	-119.8	-23.7	-48.9	-173.1	-115.1	-89.5	4.6	7.0	---	---	-558.5
2) Dry	---	---	-54.8	0.5	-22.3	-168.8	-78.4	-53.8	7.7	7.2	---	---	-362.6
3) B Norm	---	---	-30.9	1.9	-5.2	-168.9	-78.7	-48.8	8.0	6.7	---	---	-315.7
4) A Norm	---	---	-9.3	2.0	-1.5	-168.8	-74.8	-39.8	8.3	6.8	---	---	-277.1
5) Wet	---	---	-2.5	1.1	2.6	-168.8	-74.8	-44.7	7.8	7.1	---	---	-272.0
Wtd Avg.	---	---	-49.7	-5.2	-18.0	-169.9	-86.7	-57.8	7.1	7.0	---	---	-373.2

8. Quantifiable Objective

$$\text{source} = \min(\text{Step 3A Wtd Avg}, \text{Step 7E})$$

	Thousand Acre Feet												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Wtd Avg	---	---	0.0	0.0	0.3	0.1	0.0	0.3	0.8	0.2	---	---	1.9